

Amendments to the specification:

Kindly amend the paragraph starting at line 9 on page 19, as follows:

For quantitative analysis of the incorporation, same experiments were conducted by adding only dNTP (~~+59-150~~ μ M) using primer 2 (1 μ M) labeled with p32 at 5'-terminal and template 1, 2, and 3 (2 μ M)

Kindly amend the paragraph starting at line 15 on page 19, as follows:

Results are shown in Fig. 7A and B. As a result, Y was incorporated into complementary strands of A, G and X at 78%, 48% and ~~4241~~%, respectively, and Y, C and T were incorporated into complementary strand of X, at 41%, 9.5% and 13%, respectively. (Refer to Fig. 7)

Kindly amend the paragraph starting at line 5 on page 28, as follows:

2-amino-chloro-9-(2',3',5'-tri-O-acetyl- β -D-ribofuranosyl) purine (1) [M. J. Robins and B. Uznanski, Can. J. Chem., 59, 2601-2607 (1981)] (18.6 mmol, 7.96 g) was dehydrated three times azeotropically with anhydrous pyridine, and dissolved in anhydrous pyridine (~~180~~ ml), then dimethylamine hydrochloride (55.8 mmol, 4.55 g) and diisopropylethylamine (74.4 mmol, ~~12.9~~ ml) were added thereto with stirring at room temperature. The mixture was stirred at room temperature for 15 hours. After confirming completion of the reaction by TLC, water was added to the reaction mixture and concentrated in vacuo. Chloroform was added to the residue, and the organic layer was washed 3 times with water, 2 times with 5% aqueous sodium hydrogen carbonate, once with water and 2 times with 10% aqueous citrate solution, then the organic layer was dried with magnesium sulfate, and dried in vacuo after filtration. The residue was treated with azeotropic distillation with toluene until no odor of pyridine was noted, the produce was purified by silica-gel chromatography (dichloromethane-ethanol) to obtain the product (2) 5.42 g (12.4 mmol) (67%).

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Kindly amend the paragraph starting at line 6 on page 32, as follows:

The compound (5) obtained in the above (D) (3.98 mmol, 2.61 g) was dehydrated azeotropically three times with anhydrous toluene and dissolved in anhydrous dichloromethane (40 ml). 1-methylimidazolemethyimidazole (7.96 mmol, 0.64 ml) and chlorothio carbonate phenyl (5.57 mmol, 0.77 ml) were added with stirring at room temperature, then stirred at room temperature for 16 hours. After confirming completion of the reaction by TLC, 5% aqueous sodium hydrogen carbonate was added to the reaction mixture. After extracted the organic layer, the organic layer was washed one with aqueous 5% sodium hydrogen carbonate, once with water, twice with aqueous 10% citrate solution and once with water, in this order, the organic layer was dried with magnesium sulfate, filtered and dried in vacuo. The residue was purified by silica-gel column chromatography (dichloromethane-methanol) to obtain the produce (6) 2.96 g (3.73 mmol) 94%.

Kindly amend the paragraph starting at line 11 on page 32, as follows:

The compound (6) obtained in the above (E) (3.73 mmol, 2.96 g) was dehydrated azeotropically three times with anhydrous toluene, and dissolved in anhydrous toluene (88 ml). 2,2'-azo-bis-isobutyronitrile (0.746 mmol, 122 mg) was added thereto with stirring at room temperature and added argon gas with bubbling for 1 hours at room temperature. Thereto was added tributyltin hydride (5.60 mmol, 1.51 ml) and stirred at 75°C for 3.5 hours. After confirming completion of the reaction by TLC, the reaction mixture was concentrated in vacuo. The residue was purified by silica-gel column chromatography (dichloromethane-methanol) to obtain the product (7) 2.27 g (3.55 mmol) (95%).

Kindly amend the paragraph starting at line 2 on page 38, as follows:

The compound (20) 98 mg (0.24 mmol) obtained in the above (C) was azeotropically distilled three times with anhydrous pyridine (1 ml). The residue was dissolved in anhydrous pyridine 2 ml, added triethylamine 35 ml, dimethylaminopyridine 1.4 mg and dimethoxytrityl chloride 85 mg were added thereto and stirred at room temperature for overnight. Ethyl acetate

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25 ml was added to the reaction mixture. The mixture was treated with water (25 ml) for three time for separation to obtain organic layer. Each aqueous layer was washed with ethyl acetate. The organic layer was collected, dried with anhydrous sodium sulfate and concentrated in vacuo. The residue was purified by using short column (developer: 25 - 50% ethyl acetate - dichloromethane) to obtain the product (21) 132 mg (0.19 mmol) (76.7%).

Kindly amend the paragraph starting at line 21 on page 38, as follows:

The compound (21) 125 mg (0.18 mmol) obtained in the above (D) was azeotropically distilled three times with anhydrous pyridine 0.5 ml and azeotropically distilled three times with anhydrous tetrahydrofuran 0.5 ml. The residue was dissolved in anhydrous tetrahydrofuran 1.2 ml under argon atmosphere, then added further diisopropylethylamine 46 ml and (2-cyanoethoxy) (N,N-diisopropylamino) phosphine chloride 59 ml and stirred at room temperature for 1 hour. Remained chloride was decomposed by adding methanol 50 ml. Ethyl acetate containing 3 % triethylamine 25 ml was added to the reaction mixture, and water 25 ml was added for three times separation to obtain organic layer. Each aqueous layer was washed with 3% triethylamine containing ethyl acetate. The organic layer was collected, dried with anhydrous sodium sulfate and concentrated in vacuo. The residue was purified using a short column (developer: 3% triethylamine - 32% ethyl acetate - 65% hexane) to obtain the product (22) 139 mg (0.16 mmol) 92.2%.

Kindly amend the paragraph starting at line 2 on page 42, as follows:

The compound (14) (0.089 mmol, 42 mg) obtained in the above (C) was dehydrated azeotropically three times with anhydrous toluene, added 1 M tetramethyl ammonium fluoride/THF solution (0.5 ml) and stirred at room temperature for 2 hours. After confirming completion of the reaction by TLC, acetic acid (0.08 ml) was added thereto and concentrated in vacuo. The residue was dissolved in water, washed three times with ethyl acetate, and the aqueous layer was concentrated in vacuo. The residue was purified by using reverse phase silica-gel chromatography to obtain the product (15) 0.1410.4 mg (0.047 mmol) (52%).

Kindly amend the paragraph starting at line 11 on page 47, as follows:

A solution containing [5'-³²P] labeled primer DNA (20-mer, 4 mM), template DNA (35-mer, 4 mM) and 2x Klenow fragment buffer (TAKARA) were annealed at 95°C for 3 minutes, 40°C for 3 minutes and 4°C for 7 minutes. A solution of equimolar amount of 40 mM dNTP and Klenow fragment (exo⁺) (2 unit/ml, For Sequence, TAKARA) were added thereto and incubated at 37°C for 3-30 minutes. Equimolar amount of 10 M urea BPB dye solution was added and kept at 75°C for 5 minutes and electrophoresed with 20% polyacrylamide - 7M urea gel. Products were analyzed using Phosphoroimager plate. Result is shown in Fig. 12.

Kindly amend the paragraph starting at line 16 on page 48, as follows:

Proviso that in a synthesis of oligomer containing dx2, removal of protective group for amino-2-amino group of dx2, i.e. benzoylisobutyryl group, could not completely be performed, under the usual basic condition after synthesis of oligomer (conc. ammonia at 55°C for 10 hours) conventional condition using conc. ammonia at 55°C for overnight, consequently, treatment for removal of the protective group was performed under the condition at 80°C with conc. ammonia for 10 hours.